Background & Rationale
Murfreesboro Water Quality Protection Areas
February 16, 2006

I. Background

This Rationale was first distributed December 15, 2005. This version of February 16, 2006, reflects the input of stakeholders, interested citizens and the City's Storm Water Advisory Committee (SWAC), which approved draft ordinance language on February 14th for consideration by City Council.

In July, 2003, the City of Murfreesboro obtained coverage under the State of Tennessee National Pollutant Discharge Elimination System (NPDES) permit authorizing discharges of storm water runoff from City-owned and operated separate storm sewers.

Federal and State NPDES rules require the City to implement programs in:

- Public education and outreach
- Public participation and involvement
- Illicit discharge detection and elimination
- Construction site runoff control
- Post-construction runoff control
- Good housekeeping and pollution prevention

The State NPDES Phase II permit, dated February 26, 2003 and applicable to the City of Murfreesboro, states as a requirement:

> You must develop and implement a set of requirements to establish, protect and maintain *water quality buffers* in areas of new development and redevelopment.

Water quality buffer is defined:

> *Water quality buffer* means undisturbed vegetation, including trees, shrubs and herbaceous vegetation; enhanced or restored vegetation; or the re-establishment of vegetation bordering streams, ponds, wetlands, reservoirs or lakes, which exists or is established to protect those waterbodies.

In June, 2005, the State established a requirement for protection of buffer zones on new construction projects located adjacent to impaired streams:

> A 60-foot natural riparian buffer zone adjacent to the receiving stream designated as impaired or high quality waters shall be preserved, to the maximum extent practicable, during construction activities at the site.

This requirement, already in place via the State's NPDES construction general permit, applies to construction along certain streams in Murfreesboro, including all of Sinking Creek, Lytle Creek, Bear Branch, Dry Branch, an unnamed tributary of Bushman Creek (Big Ditch), and portions of the Stones River itself.

II. Reasons for establishing a water quality buffer policy

The buffer policy is required by the State Phase II storm water discharge permit.

In addition, water quality buffers provide the City and its citizens environmental protection and resource management benefits:

a) removing pollutants delivered in urban storm water;
b) reducing erosion and controlling sedimentation;
c) stabilizing stream banks;
d) providing infiltration of storm water runoff;
e) maintaining base flow of streams;
f) contributing the organic matter (e.g., leaf litter, woody debris) that is a source of food and energy for the aquatic ecosystem;
g) providing tree canopy to shade streams which lessens the potential for harmful algal blooms where significant levels of nutrients are present;
h) providing riparian wildlife habitat; and
i) furnishing scenic value and recreational opportunities.

Benefits of a water quality buffer zone to a property developer can include:

- Reducing loss of stream bank and erosion of land
- Avoiding need to obtain an Aquatic Resource Alteration Permit (ARAP) from the Tennessee Department of Environment and Conservation (TDEC) for grading next to a stream, creek or other body of water;
- Avoiding the necessity for a permit from the U.S. Army Corps of Engineers;
- Providing natural flood storage and flood conveyance alongside the creek or stream;
- Increasing natural vegetation, property aesthetics and property value; and
- Reduced maintenance and landscaping.

Thus, to comply with the City's NPDES permit and for the immediate and long-term benefits to the City's aquatic resources, the City of Murfreesboro will enact a set of standards and procedures for establishing, protecting and maintaining streamside water quality buffers.

III. Administering the water quality buffer ordinance

City staff have adopted the term Water Quality Protection Area ("WQPA") to refer to water quality buffers.

Several City departments are involved in the administration of the WQPA.

Planning and Engineering:	Reviews plats and plans, including WQPA zone widths, construction plans; inspects during construction activities
Urban Environmental.:	Reviews WQPA proposals where planting and/or tree removal is involved; inspections during and after construction
Water & Sewer:	Involved in reviewing plans and monitoring compliance with maintenance of WQPA; Water and Sewer Board involved in hearing waiver requests and appeals
Building and Codes:	Involved in enforcement of WQPA ordinance

IV. Discussion and rationale for WQPA criteria

A. In areas of new development and redevelopment

As quoted above from the Phase II permit, the requirements for establishing WQPAs must apply in areas of new development and redevelopment.

The terms development and redevelopment are defined in the City's Stormwater Management ordinance as follows:

> *Development*. Any man-made change to improved or unimproved real estate, including but not limited to, Buildings or other Structures, mining, dredging, Filling, Grading, paving, excavating, drilling operations, or permanent storage of materials (defined as materials of like nature stored in whole or in part for more than six months).
>
> *Redevelopment*. Any man-made change to improved real estate, including but not limited to, Buildings or other Structures, mining, dredging, Filling, Grading, paving, excavating, drilling operations, or permanent storage of materials (defined as materials of like nature stored in whole or in part for more than six months). (Note: Demolition and reconstruction is considered Development and not Redevelopment.)

We believe that in areas of new development, or where redevelopment is extensive, requirements to establish or protect a WQPA should apply to the whole site. Where redevelopment is not extensive or significant with respect to storm water runoff quality or quantity, it seems reasonable to apply the WQPA not to the whole site but only the project activities, but addition of structures would not be allowed in the WQPA.

We propose the following definition for Significant Redevelopment:

Significant redevelopment. Redevelopment that has a value greater than 50% of the property's current assessed value; increases the impervious surface area of the property; redirects the flow of storm water in any way; modifies the storm sewer system; or is likely to result in additional pollutants to the storm water characteristics.

The following section of the ordinance limits application of the WQPA to new development and redevelopment.

> The WQPA requirements apply to all proposed development and redevelopment, except for development which prior to the effective date of this ordinance:
>
> a. Is covered by a valid, unexpired plat in accordance with development regulations;
> b. Is covered by a current, executed public works agreement;
> c. Is covered by a valid, unexpired *Murfreesboro land disturbance permit or* building permit; or
> d. Has been granted Planning Commission approval of preliminary plat or site plan.

Staff considered the matter of planned developments for which a master plan had been previously submitted, and whether or not those developments should be exempted from a WQPA requirement. Submission of a master plan does not, in and of itself, obligate the developer to proceed in accordance with that plan, nor does submission of any such plan create a vested right in the developer for purposes of any other City regulation. However, among staff there was consensus that some degree of recognition should be given to master plans where there had been a greater degree of certainty and of detail and where changes to accommodate the WQPA might be difficult. Staff favor recognizing these situations by providing a special provision for variance. The criteria for variances are described in Section VII below.

B. Identification of streams and applicability of the WQPA

1. We believe the WQPA requirement must apply alongside streams, rivers, ponds that intersect streams, spring-fed streams and wetlands. These are waters which exist on a regular or intermittent basis, normally support fish and/or aquatic life, and receive protections in State law and regulations.

   With respect to wetlands, this ordinance applies to wetlands adjacent to streams. Being adjacent to streams is a criterion for identifying wetlands under the Army Corps of Engineers (COE) jurisdiction. Those wetlands subject to COE jurisdiction will serve as our regulatory reference point.

The focus of this ordinance is riparian stream protection and restoration. Isolated wetlands of one quarter of an acre or more receive protection under State regulation, and we prefer not to enter into assessments of isolated wetlands beyond the State requirements (http://www.state.tn.us/environment/permits/arap.php).

2. Definitions

   The City proposes the following definition for stream:

   Stream refers to waters of the state except for those waters flowing within wet weather conveyances. In the absence of a definitive assessment by the State of whether a watercourse is a stream or a wet-weather conveyance, the following watercourses[1] are considered to be streams:

   i. Watercourses serving drainage areas of 100 acres or more;
   ii. Watercourses known to flow regularly after seven days of dry weather (e.g., spring-fed or wetland-related surface water);
   iii. Watercourses identified as a dashed blue line on the USGS map; and
   iv. Watercourses identified as a continuous blue line on the USGS map.

   The City may conclude, subject to review by the State, that a watercourse or segment of watercourse is not a stream, based on a review of field data assessing its geomorphology, hydrology and biology.

3. The City examined several small watersheds where known streams exist, and from these examples proposes to consider watersheds of 100 acres to result in a stream. For example:

Stream name	Location	Features	Watershed size
Little Ditch	Hwy 96/New Lascassas Pike at Rutherford Blvd.	Engineered channel approx. 20 feet wide at top of bank	131 acres
Tributary to Little Ditch	Hwy 96/New Lascassas Pike at Rutherford Blvd.	Spring-fed watercourse	4 acres by surrounding topography

[1] The Stormwater Management Ordinance defines Watercourse as a Channel, natural depression, slough, gulch, stream, creek, pond, reservoir, or lake in which storm runoff and flood water flows either regularly or infrequently. This includes major drainage ways for carrying urban storm runoff.

Unnamed tributary to Overall Creek	Blackman Grove, Blaze Drive	Jurisdictional wetland within watershed	140 acres
Unnamed tributary to Spence Creek	Hwy 99 and Cason Lane, Three Rivers development	Draining farmland north of Hwy 99	250 acres
Unnamed tributary to Middle Fork Stones River	Stevens Bend, off County Farm Road	Two watercourses collect at the eastern edge of the subdivision	348 acres
Unnamed tributary to Lytle Creek	Downtown area, Cannonsburg	Highly urbanized	120 acres (TDEC estimate)

4. The City intends that the WQPA would only apply to watercourses which exist prior to the development in question. Thus if during development a person constructs a channel draining an area of 100 acres or more, the development would not be subject to the WQPA requirement. Subsequent development alongside this channel, where the drainage area is 100 acres or more, would be subject to the WQPA requirement, unless the channel is determined to be a wet-weather conveyance.

5. By using the above definition of stream, the City does not represent that this definition will be controlling for state or federal regulatory authorities.

C. Model water quality buffer; vegetation, zones and widths

A water quality buffer is intended to be an undisturbed, natural area. Observations and studies show that disturbances, especially long-term, of the natural area lead to degradation of a stream system and water quality, and that leaving the riparian area undisturbed is beneficial to stability and health of the stream.

In order to establish standards for a WQPA, the City reviewed several model buffers. Universities, government agencies and water quality organizations have prepared information on model riparian buffers. Our review focused on buffers for protection of water quality.

Here are some of the key features of model riparian buffer zones for urbanizing areas:

- zones within the buffer, usually three zones
- recommended minimum widths of the buffer zone
- undisturbed vegetation in the zone adjacent the stream, the “streamside zone”
- native types of vegetation preferred

- a middle zone consisting of a variety of plants, including shrubs and non-woody plants
- an outer zone of grasses for spreading out concentrated storm water flow toward the stream

It is especially important that trees are allowed to mature and naturally regenerate in the streamside zone and that this zone remains undisturbed. Because of the undisturbed nature of this zone, it is referred to as "forest." The naturalized tree and understory growth, tree cover and root structures protect the physical and ecological integrity of the stream.

Here are three references for more information:

- NRCS, Tennessee Conservation Practice Standard; "Riparian Forest Buffer (391)" http://efotg.nrcs.usda.gov/treemenuFS.aspx?Fips=47149&MenuName=menuTN.zip (The Jobsheet and the Standard are found in the eFOTG at Section IV. F. Conservation Practices, "Riparian Forest Buffer.")

  The NRCS standard includes a two or three zone riparian buffer and notes: "The minimum combined width of Zones 1 and 2 will be 100 feet or 30 percent of the floodplain, whichever is less, but not less than 35 feet." The Zones 1 and 2 refer to zones of forest and woody vegetation.

  The standard also specifies a Zone 3: "Zone 3 shall be added to the riparian buffer to address concentrated flow erosion and maintain sheet flow. The Filter Strip standard (conservation practice code 393) shall be used to design Zone 3." The minimum recommended width of the NRCS Zone 3 is 20 feet. This Zone 3 ideally consists of permanent and dense herbaceous (non-woody) vegetation consisting of a single species or a mixture of grasses, legumes and/or other non-woody plants, adapted to the area.

- Tennessee Erosion Prevention and Sediment Control Handbook, Chapter 2, Vegetative Practices; "Buffer Zone-BF"; http://216.111.31.13/bonnie/2.%20Veg%20Practices.pdf

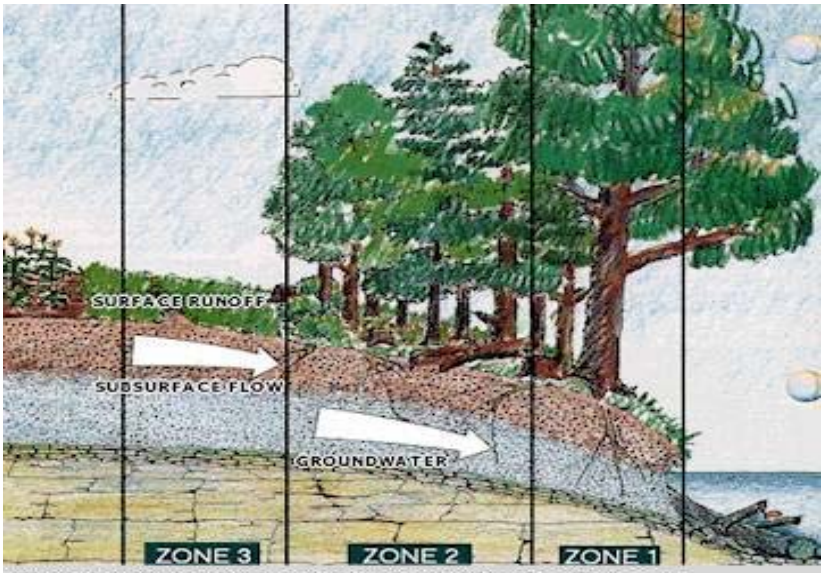
  This handbook, developed by the University of Tennessee Water Resources Research Center, recommends a buffer be a minimum of 50 feet wide. A 50 foot wide buffer would consist of a forested zone 1, 20 feet wide, plus a zone 2 in shrubs, flowering plants and trees. The zone 3 contains grasses for sediment and chemical capture.

- Environmental Protection Agency, Post Construction Storm Water Management in New Development and Redevelopment, Buffer Zones, web page http://cfpub.epa.gov/npdes/stormwater/menuofbmps/post_6.cfm

- "Riparian Buffers Benefits and Designs," United States Environmental Protection Agency, Region IV Nonpoint Source Program, 2002

- Stormwater Manager's Resource Center, Fact Sheet, Aquatic Buffers http://www.stormwatercenter.net/

Sketch below indicates a typical or model riparian buffer.



Sketch of a typical riparian forest buffer (Source: Chesapeake Bay Program, 2000)

D. Proposed width and zones

1. Establishing a width of WQPA is a primary issue.

   Because a wider buffer offers greater protection to stream and riparian flora and fauna – we are aware of recommended widths of 300 feet, for instance – and because landowners often want a less restrictive narrower buffer, a regulatory minimum width has to be a compromise.

   We note that water quality specialists recognize a variety of factors that affect the function of a buffer. This means that the most cost-effective and efficient buffer would have different widths for different sites, involving the site-specific soils; existing vegetation; potential enhanced vegetation; watershed characteristics such as land area, present and future land use, priority pollutants, topography and hydrology; site-specific riparian and stream conditions. To assess these factors for each site could be cumbersome and costly, and we prefer to define our buffer with fixed widths.

   The EPA Region IV report referenced above concludes, "… there is no 'one right answer' when it comes to buffer programs and buffer designs. The 'ideal' buffer should be designed to provide the most efficient and effective environmental controls for a particular area, and should be acceptable to landowners. The 'ideal' buffer program should support both needs."

2. Important considerations

   State and EPA regulators must recognize that the City's buffer sufficiently addresses stream impairment and total maximum daily load (TMDL) issues.

The Stones River watershed is subject to a sediment and habitat alteration TMDL. In order to achieve that recognition, City staff prefer to meet the minimum recommended buffer standards, specifically a minimum width of fifty feet on intermittent and perennial streams streams. This will serve as a positive step to address TMDL requirements.

Our buffer must accomplish several functions, which need to be factored into deciding on width measurements. As to sediment, grassy buffers of 25-30 feet have shown over 80 % removal of total suspended solids in storm water run-on/run-off. Shading, habitat and stream bank stability are provided by a streamside, forested zone. Infiltration of storm water is promoted by dissipation of water flow energy and the area provided in an outer zone. We thus want to have substantial widths for at least these three functions.

3. In recommending a width of the WQPA, the City proposes to recognize two levels of streams: streams that are mapped on the USGS, 7.5 minutes topographic map, which are typically larger, well-recognized streams; and streams that are unmapped, which are usually small and often do not have flow during much of the year.

4. We recommend the WQPA be described in two zones. The zones take into account that a WQPA has several functions that do not demand the same type of vegetation across its entire width, and the zones allow more flexibility in setting forth allowed uses of the WQPA.

5. For streams identified on the updated USGS, 7.5 minute topographic map

   The City proposes a WQPA width of 50 feet from the top of the stream bank, in two zones. Zone 1 is measured 35 feet from the top of bank perpendicular to the stream channel. Zone 2 is measured 15 feet along the same perpendicular line beginning at the outside edge of Zone 1.

6. For streams not identified on the USGS 7.5 minute topographic map

   a. A WQPA width of 35 feet from the top of the stream bank, in two zones. Zone 1 is measured 20 feet from the top of bank perpendicular to the stream channel. Zone 2 is measured 15 feet along the same perpendicular line beginning at the outside edge of Zone 1.

   b. Though these waterbodies are recognized as streams, in many cases they are dry most of the year. Thus, staff propose a narrower buffer but one which will provide significant protection of stream quality, including construction-phase protection of the stream and stream bank, long-term canopy and a measure of riparian habitat, and dissipation of otherwise erosive storm water runoff flows into the stream.

7. Target vegetation within the zones

a. Target vegetation in Zone 1 is mature, naturally regenerating vegetation. Zone 1 must remain undisturbed, and the pre-existing vegetation allowed to grow naturally.

b. Generally staff would prefer that Zone 2 remain undisturbed and the pre-existing vegetation be allowed to grow naturally. This depends on the site's pre-existing vegetation, the nature of the riparian zone, and the development activities. In some cases, grasses would be preferred. Nevertheless, in Zone 2 vegetation other than the pre-existing, undisturbed vegetation is allowed and the vegetation can be managed, including cutting and mowing. "Managed Vegetation" is a term defined in the ordinance as "management that does not involve grubbing, clearing, tilling, disking or plowing of the ground. Cutting, mowing, pruning, no-till planting, and aeration are allowed activities of Managed Vegetation." Managed vegetation is allowed in Zone 2.

c. Ideal vegetation in both zones is native, non-invasive/non-exotic plants. The ordinance provides for replacing, restoring and enhancing WQPA vegetation with native plants. If one wants to replace existing, invasive vegetation with native materials, one must receive approval of the City.

V. Uses and protection of the WQPA

A. Restriction on uses within the WQPA

In general, any disturbance to the WQPA reduces its function of protecting stream water quality. However, the community's enjoyment of water resources would be compromised if there were no access to the stream at all. In addition, certain public-benefit infrastructure practically has to be located across or near streams in places. Thus, we propose allowing the following uses within the WQPA.

Zone 1 -- Publicly accessible Greenways[2]; utility and road crossings; and

Zone 2 – Uses allowed in Zone 1; and utility right-of-way

The popular Greenway system provides excellent opportunity for making citizens aware of our water resources and the need to protect storm water and surface water quality. This public benefit feature of *a* Greenway is a factor in our providing for

[2] For the purpose of this ordinance, a Greenway is a linear open space established along a natural or constructed corridor (e.g. stream, river or railroad) which is designed to connect recreational areas with cultural or historic features and/or populated areas for pedestrian and/or bicycle traffic. A Greenway is developed and maintained to provide protection of natural resources, transportation alternatives, and recreational opportunities. A Greenway may include associated amenities (e.g. interpretive markers, canoe launching areas, and trailhead facilities such as buildings, picnic areas and playgrounds) with the linear pathway.

Greenway in the WQPA. Trails or paths not providing public access according to Greenway standards could not be allowed placement in the WQPA. The ordinance provides that Greenways be designed and constructed to protect the water quality features of the WQPA to the maximum extent practicable.

In addition, exception to the no-disturbance standard is allowed for road, bridge, path and utility crossings of streams where necessary. These crossings are subject to approval by the City and certain design criteria. In addition, the City may allow repair and maintenance of public improvements, provided that specifications for the project address means to avoid and lessen adverse impacts to wetlands and associated aquatic ecosystems.

Construction of drainage swales and other storm drainage systems is prohibited, except with written approval from the City Engineer. Planning Commission approval of plans showing storm water drainage features within the WQPA constitutes approval of the City Engineer. The City Engineer's office reviews and comments on the plans prior to presentation to the Planning Commission.

Application and storage of pesticides, herbicides and fertilizers is prohibited except with written approval from the City.

B. Criteria for placement of Greenway within the WQPA

In order to recognize and maximize the benefits to water quality of adjacent streams, the City proposes the following criteria for the design and placement of Greenways in the WQPA:

- Design and placement outside Zone 1 insofar as practicable
- Design and placement that takes into account natural fluctuations in stream channel
- Design and placement that takes into account location of invasive, exotic plants or other undesirable vegetation, and lack of vegetation (i.e., disturbance of these areas is preferred before other areas with mature, native vegetation)
- Grading and planting to maintain or establish storm water "sheet flow" and infiltration of storm water
- Where watercourses cross the greenway, care to provide ample culvert or channel structure to avoid scour
- Minimizing the disturbance of native vegetation
- Re-establishing vegetation where missing

With respect to operation of greenway path within the WQPA, the City proposes the following standards:

- Management of the greenway to include litter pick-up and monitoring and elimination of erosion or other polluting activities
- Management of the greenway to include removal of invasive, exotic plants

- Programs or materials to educate users about surface water quality

C. Disturbance of the WQPA is limited.

The WQPA is to be an undisturbed area. Persons are not allowed to clear or grub existing vegetation; to disturb soil by grading, stripping or other means; to fill or dump soil or materials; or to build or place structures.

The WQPA must be staked and flagged prior to development activities.

Developers, homebuilders, commercial property owners, property managers and homeowners associations must communicate to property users the protected nature of the WQPA.

D. The following language is proposed for long-term recognition and protection of the stream WQPA.

1. All site development plans and plats prepared for recording shall:

   - Show the extent of any WQPA on the subject property by metes and bounds and be labeled as “Water Quality Protection Area – Do Not Disturb”;
   - Provide a note to reference the WQPA, "There shall be no clearing, grading, construction or disturbance of soil and/or native vegetation except as permitted in writing by the City of Murfreesboro Planning and Engineering Department"; and
   - Provide a note to reference protective covenants governing all WQPAs, stating, "Any water quality protection area (WQPA) shown hereon is subject to protective covenants which restrict disturbance and use of these areas."

2. All WQPAs shall be maintained through a declaration of protective covenant, documentation of which is required to be submitted to the Planning and Engineering Department. The covenant shall be recorded in the land records and shall run with the land and continue in perpetuity. The City can provide land owners with appropriate language upon request.

3. In subdivisions of one- and two-family residential lots, the WQPAs may be implemented as common area under the management of a mandatory homeowners association.

VI. Buffer restoration and enhancement

A. Initiating tree growth where a stream lacks canopy

The City proposes to require property developers to establish tree growth alongside stream segments without pre-existing tree canopy; the goal is to hasten tree canopy cover to the stream. Tree cover is a key factor in preventing State and EPA-

recognized water quality impairment. Out of ten water-quality impaired stream segments in the City, four are impaired in part because of lack of stream side vegetation.

1. Tree cover provides significant benefit to water quality:
    - Shading to lower water temperature and to reduce algal growth;
    - Habitat for aquatic organisms;
    - Source of detritus and large woody debris for aquatic and terrestrial life;
    - Structure to stabilize banks, preventing erosion;

2. A lack of pre-existing tree canopy and need to enhance WQPA

    Pre-existing tree canopy means a corridor of trees rooted near (within approximately 15 feet of) the stream's top of bank, providing canopy and shade along the stream.

    Where a property has no pre-existing tree canopy or the canopy is broken by a forty-foot or greater section(s) without canopy, as traced out by the drip lines of adjacent trees, the City will require planting of trees in this section. The City will recognize and provide exception where tree planting is impractical because of lack of soil and presence of large areas of underlying rock or would involve too much soil disturbance because thick brush is present alongside the stream bank.

    These plantings are intended as a simple mechanism to hasten tree growth adjacent the stream. Planting of seedlings/saplings will accomplish our purpose. We prefer not to complicate the requirement by requiring a warranty. We expect a benefit to the WQPA by this requirement but do not expect or want to require that all the trees will survive.

3. Tree planting standards, residential property development
    - A variety of native tree seedlings/saplings[3] planted on ten-foot centers in the area alongside the stream, within 15 feet of the top of stream bank.
    - Tree plantings shall be non-invasive, native species. The City can provide a list of such species.
    - Planting must be done at a time to minimize stress to plants. All planting must be completed by the next planting season not to exceed six months time after a certificate of occupancy is issued on an adjacent streamside building.

[3] Seedling/Sapling means a deciduous, native, non-invasive canopy tree with a minimum height of 24 inches and minimum caliper of 3/8 inches at time of planting. Seedlings/ Saplings can be bare-root or container grown. All Seedling/Saplings are to have well developed root systems, to be free of insects and disease as well as mechanical injuries, and in all respects to be suitable for field planting.

4. Tree planting standards, commercial property development

   In the case of commercial property, the City proposes that plantings initiated to fulfill the requirements for perimeter and buffer zone landscaping, of the City Zoning Ordinance, Section 27, may be allowed to serve as the WQPA planting requirements, provided the plantings are initiated adjacent the stream and will function to establish canopy alongside the stream.

B. Restoration of damaged WQPAs

1. The City will require a property owner or agent to restore vegetation where development activities remove vegetation within the WQPA without permission from the City.

2. A plan for restoration should be prepared promptly, after damage to the vegetation has occurred, and submitted to the City for review. Persons in this situation are encouraged to consult the City for advice on restoration of WQPAs.

3. Well-recognized State and/or Federal references shall guide the City in reviewing plans for establishing vegetation in the WQPA, such as:

   a. Natural Resource Conservation Service, Tennessee Field Office Technical Guide, Section IV. F. Conservation Practices, *Riparian Forest Buffer (AC) (391)*;

   b. Tennessee Erosion Prevention and Sediment Control Handbook, "Disturbed Area Stabilization (With Permanent Vegetation) – PS"; http://www.state.tn.us/environment/wpc/sed_ero_controlhandbook/;

   c. "Stream Corridor Restoration: Principles, Processes, and Practices," The Federal Interagency Stream Restoration Working Group, rev. 2001, which can be found at www.nrcs.usda.gov/technical/stream_restoration/ ; and

   d. "Stream Mitigation Guidelines," TDEC, July 2004, which can be found at www.state.tn.us/environment/wpc/publications.

C. Enhancement of WQPAs

A developer or property owner may wish to enhance a WQPA to bring it closer to an optimal, undisturbed native plant condition and/or to an optimal condition for water quality benefit. Typically this would be where invasive, non-native (or exotic) plant species have located in riparian (and other) areas and begin to dominate native species. These plants are less desirable for the function of a WQPA.

For this reason, the City may allow replacement of invasive, exotic plants, provided that a landowner submits a WQPA enhancement plan to the City and City staff

approve the plan in writing. Persons interested in invasive plant removal and replacement may contact City staff.

VII. Variances

A provision for variances is considered a practical necessity to implementing the WQPA. The following criteria are proposed:

a. Those projects or activities where it can be demonstrated that strict compliance with the ordinance would result in extreme practical difficulty or substantial financial hardship; or
b. Those projects or activities serving a public need where no feasible alternative is available; or
c. For developments in planned development zoning districts which have a master plan approved by the City Council before February 14, 2006, the standards for granting the variance may be less restrictive than in a. above, and the degree of variance granted may be greater than for other variance requests.

Requests for variances shall be submitted to the Director of Murfreesboro Water and Sewer Department for hearing before the Water and Sewer Board. City staff have considered establishing a specialized board to focus on environmental and water quality related issues; however, at this time City staff prefer to have variances related to this ordinance heard before the Water and Sewer Board. Based on the number and type of requests for variance and on additional stormwater ordinance changes in the future, there may arise the need for the separate board.

VIII. Request for comment

The City requests comment on the proposed water quality protection area standards. Comments may be submitted to Robert Haley, Murfreesboro Water and Sewer Dept., 220 NW Broad Street, Murfreesboro, TN 37133-1477; e-mail roberthaley@murfreesborotn.gov.

IX. Steps to adoption of the WQPA requirements

Presentation of draft ordinance to SWAC and stakeholders	Dec. 13, 2005
Meeting of stakeholders, interested persons, comments rec'd.	Jan. 9, 2005
Response to comments developed and presented before the SWAC	Jan. 17, 2005
SWAC recommends revised proposal for consideration by City Council	February 14, 2006
Presentation for consideration and adoption by City Council	TBD